

MIGRATION RECORDS IN AUSTRALIA: 5 LYCAENIDAE AND NYMPHALINAE (LEPIDOPTERA)

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Abstract

Of 134 Australian species of Lycaenidae four have been reported as migrants and of 28 species of Nymphalinae five are considered confirmed or possible migrants. New migration data on species in these groups and a summary of published records are given.

Introduction

This paper presents new migration data on species of Lycaenidae and Nymphalinae in Australia. Previously, similar records have been published on Hesperidae and Papilionidae (Smithers, 1978), Danainae and Acraeinae (Smithers, 1983) and Pieridae other than *Anaphaeis java teutonia* (Fabricius) (Smithers, 1983a). Of the 134 species of Lycaenidae in Australia only four have been suggested as migrants. Of the 28 species of Nymphalinae recorded for the continent five have been confirmed as, or are suspected of being, migrants.

Lycaenidae

Lampides boeticus (L.)

This species was recorded on Erskine Island, Capricorn Group, from 13-23rd May 1970 (Reeves, 1971). Its presence on an island reported to be devoid of suitable larval food plants implies immigration of adults. *L. boeticus* was collected in the Great Australian Bight, 320 km from land, on board m.v. *Iron Cavalier* on 8th March 1969 (obs. L. G. Packman). Other insects were observed and collected at the same time (Smithers, 1970). It was seen moving south in August and September 1974 at Mt Tamborine, Queensland (Moulds, 1976). These records suggest that long distance flights may be a frequent occurrence for the species in Australia. It is known to be a migrant in other parts of its range such as India and Europe.

Zizina labradus (Godart)

Apart from the conspicuous SW migration observed in January, 1963 between Milthorpe and Blayney, New South Wales, (Smithers, 1963) few additional observations have been reported. Many specimens were seen moving N at Ryde, Sydney, on 28th November, 1966 (obs. J. V. Peters), an invasion was reported for Heron Island, Queensland, in January 1971 (Fletcher, 1973) and very strong N movement (against a strong wind) was seen from Cobar to 100 km W of Cobar on 12th October, 1977 (obs. C. N. and A. S. Smithers).

Theclinesthes onycha onycha (Hew.)

This species was seen on Erskine Island, Capricorn Group, from 22nd-23rd May 1970 (Reeves, 1971); the comment under *L. boeticus* above applies here.

Narathura araxes eupolis (Miskin)

Moulds (1976) records migration of this species in a SSE direction at Lloyd Bay (25.ix.1974) and Restoration Bay (13.x.1974) Queensland.

Nymphalidae

Nymphalinae

Hypolimnas bolina nerina (F.)

Although this species occasionally appears in New Zealand (Hudson 1928, 1950; Gibbs 1961; Holloway 1954, 1962; Fox 1978) and is sometimes seen in numbers well south of its normal range there does not appear to be any record of extensive unidirectional flight. Ramsay and Ordish (1966) have a full account of New Zealand records. Moulds (1963) and Peters (1963) record specimens seen in Sydney during January and February 1962 and Moulds (1964) records specimens in the same area during January, February and March 1963. Rose (1972) mentions specimens in Kuring-gai Chase National Park, near Sydney, in February and March 1971. During the same period specimens were seen in various areas near Sydney (obs. J. V. Peters, C. Trickett, L. C. Haines, M. Lovell, G. F. Smithers) and it was reported as common at Maitland (obs. A. D'Ombraïn). At Orange (obs. M. S. Moulds) it was common from 20th-27th January.

Movement patterns of this species appear to be very similar to those of *Euploea core* and it is interesting that the extensive southerly invasion of 1971 coincided with an invasion of *Danaus hamatus hamatus* (W. S. Macleay) (Smithers, 1983).

Hypolimnas missipus (L.)

This species occasionally appears in coastal New South Wales well south of its normal range but there are no reports of obvious unidirectional flights. There is one published record (Evans 1977) of this species appearing on Norfolk Island. It is not known whether it is established there.

Junonia villida calybe (Godt.)

Hudson (1928, 1939), Holloway (1954), Gibbs (1961) and Fox (1978) refer to appearances of this species in New Zealand and Williams (1920, 1939) refers to it as a migrant and gives details of a northerly movement in the early morning off Port Pirie, South Australia, on 12th March 1939. K. A. Williams (1968) reported northerly movements from Gosford to Port Macquarie, N.S.W., on 10th and 11th November, 1966 at which time Gall (1966) reported immense westerly migrations at Stradbroke Island and Shore Bay, Queensland. Table 1 shows that movement was evident at that time at least as far south as Sydney. Hembrow (1968, 1974) reported a north-westerly movement in the Belmont-Ipswich-Tamborine area in November 1966 and a northerly movement in Brisbane in November 1973.

Table I gives recent significant records of movements. In 1966 there were clearly large scale movements extending from Sydney to Queensland,

varying from west to north during the second half of October and into November. In 1967 a mainly north-westerly movement was noted in Queensland from late September to early November. In 1968 a small westerly or south-westerly movement seems to have taken place at least in northern New South Wales and south-eastern Queensland during October and November. Records for 1969 and 1970 are few but in April and October westerly and south-south-westerly movements were seen in Sydney in 1969 and a single

TABLE 1
Summary of new migration records of *Junonia villida*

Locality	Date	Direction	Observer
Sydney, N.S.W.	22.x.66	NW 1/min/20m	A. S. and C. N. Smithers
Mt. Tamborine, Q.	12.xi.66	WNW	M. S. Upton
Edungalba, Q.	27.ix.-16.xi.67 (peak 9.xi.67)	NW (sometimes NE or W)	E. Adams
Gold Coast - Yatala, Q.	8.x.68	SW	A. Bird
Sawtell, N.S.W.	18.xi.68	W (from sea)	P. Wilson
Sydney, N.S.W.	12.iv.69	W 23/min	M. Gray and R. Jeffery
Sydney, N.S.W.	15.x.69	SSW 12-15/min/30m	J. V. Peters and R. Jeffery
Wallacia, N.S.W.	4.iv.70	NNW 10/min/50m	J. V. Peters
48km N Singleton, N.S.W.	12.iv.77	NW 10/min/20m	C. N. Smithers
48km N Singleton N.S.W.	16-17.iv.77	N 5/min/20m	C. N. Smithers
48km N Singleton N.S.W.	23-25.iv.77	NW 1-2/min/20m	C. N. Smithers
48km N Singleton N.S.W.	22.iii.80	NW 1-15/min/20m	C. N. Smithers
48km N Singleton N.S.W.	5-6.iv.80	NW 100/15min/20m	C. N. Smithers
48km N Singleton N.S.W.	12.iv.80	NW 100/15min/20m	C. N. Smithers
48km N Singleton N.S.W.	27.iv.80	NNW 10/min/20m	C. N. Smithers
48km N Singleton N.S.W.	5.iv.81	N 1/min/20m	C. N. Smithers
48km N Singleton N.S.W.	17-20.iv.81 (movement ceased bv 25.iv.81)	N 10/min/20m	C. N. Smithers

observation of a north-north-westerly movement was made for April 1970. There are no reports from then until 1977 when a spectacular migration to the north or north-west over a period of two weeks in April was seen about 50 km north of Singleton. A similarly spectacular movement was observed at the same place from late March to late April 1980 and again in April 1981.

In 1981 the movement continued until 20th April but was no longer in evidence when the area was visited again on the 25th.

There is some variation in time of year at which major movements take place in this species; these can be summarized as follows:

- 1966. — late October - early November.
- 1967. — October - early November.
- 1968. — October - November.
- 1969. — April. October.
- 1970. — April.
- 1977. — April.
- 1980. — March - April.
- 1981. — April.

Smithers (1969) has reported variation in times of movement for *Vanessa kershawi* (McCoy). The variation does not coincide from year to year in the two species. There is less data for *J. villida* than *V. kershawi* but clearly the former is a species which warrants further study in eastern Australia.

There emerges from the data so far available a clear indication of time periods in the year when obvious population movements can be expected, an October/November period and an April period. The records show predominantly northerly movements for both periods with occasional records for other directions. These are mainly for coastal localities and might well represent local variations in directions. Detailed observations over a small area during heavy migration need to be made to establish whether this is so.

Vanessa kershawi (McCoy)

Smithers and Peters (1966) and Smithers (1969) provide accounts of migrations of *V. kershawi* in eastern Australia from 1963-1968 and summarize the earlier literature on its movements. Smithers (1974) reported on its movement in Western Australia in 1973. Between the spring of 1969 and mid September 1981 more than 230 observations on movements have been recorded in eastern Australia. It is not practicable to provide full details of these observations in table form similar to those for other species but a summary is presented here; details of the original data are filed in the Australian Museum.

Perusal of the data shows that periods of population movement can be distinguished and these are recorded here as separate movements, the data pertaining to a particular movement being covered by a general statement on its extent, direction and period in chronological order.

- 1969. 1-9 September.—Small SW, SSW migration at Turrumurra, N.S.W.
- 1970. February-March.—Large numbers seen in Dandenong area, Victoria; with movement from there to N. N movement seen in Sydney at the same time.
- 1971. September-October.—Erratic, small scale S, SW and W movements over wide area from Victoria to Queensland. At no time were populations high and movements lasted for a few days only in each area.

1972. Early October.—Light migrations to SW, W, Sydney, N.S.W.
1973. Mid-August-and October.—Large migrations SW, W in many localities from Victoria to as far north as 48 km N of Singleton, N.S.W. and from coast to as far inland as Bathurst. These migrations were taking place at the time of the Western Australian migrations reported by Smithers (1974).
1974. End September-mid October.—Light S, SW movements recorded 48 km N of Singleton, N.S.W., Sydney and 27 km N of Albury.
1978. 5 March.—Large influx and N movement. Engadine, nr. Sydney.
8-18 November.—Large scale movements S, SW, WSW from Cowra, Bathurst, Wagga Wagga, Sydney.
1979. 18 August-8 September.—Large scale movements S, SW, W recorded 48 km N of Singleton, N.S.W. and Sydney.
1981. 21 April.—Heavy migrations N 48 km N of Singleton, N.S.W.
11-13 September.—Strong migrations SE, 48 km N of Singleton, N.S.W.

These records show that the main movements in *V. kershawi* can be expected in a S, SW or SSW direction over a period of weeks at some time from mid August to late November. The flights do not occupy the whole of this period between these extremes. This confirms the general conclusions reached on the basis of earlier data (Smithers, 1969). The new data also shows that in the February-March-April period there are less conspicuous, possibly shorter, periods of migration activity, with the movement predominantly northerly. This is suggested by the observations in 1970, 1978 and 1981. The 1970 records, from the Dandenongs, Victoria (obs. A. M. D. Riddell) is particularly interesting as it suggests that the actual beginning of the movement was observed. There were large numbers seen "assembling in a forest". A few days later they were seen taking off in groups in a northerly direction. At about the same time northerly movements were recorded in Sydney. Gibbs (1969) and Fox (1978) recorded occurrence of *V. kershawi* in New Zealand in September-November 1968 at a time when major flights were seen in eastern Australia (Smithers, 1969). It seems, therefore, that there is an established and observable pattern, in this species, of two-way migration towards southern areas in spring and early summer and away from them in autumn.

Vanessa itea (F.)

Seitz (1890) records *Vanessa itea* as flying out to sea and although it is generally thought of as a migrant species there are remarkably few observations recorded. This may be due to the fact that the moving populations are usually small and migrations are not obvious. Records of migration for *V. itea* are summarized in Table 2.

Although there are so few detailed records for this species it seems that there is usually a southerly or westerly movement between September and November. The records for March 1963 and January 1964 for Broken Bay and Kariong and for April 1981 for north of Singleton are interesting in that they indicate a return movement (as the Dandenong record does for *V. kershawi* above). Occasional specimens of *V. itea* are often seen amongst

moving populations of *V. kershawi* and the two species have a very similar migration pattern. Also, all of the records for *V. itea* of which details are known occurred within or very close to periods during which *V. kershawi* migrations have been reported although their directions of flight do not always correspond, e.g. when *V. kershawi* was recorded as flying N (21.iv.1981) *V. itea* was flying to the NW at the same locality. It is interesting to note that at the same time and place *J. villida* was also migrating N in large numbers.

TABLE 2
Summary of migration records for *Vanessa itea*

Locality	Date	Direction	Observer
At sea, 4.5km off Cronulla, N.S.W.	10.xi.1938	—	D. L. Serventy
Off Montague Is., N.S.W.	1.xi.1939	—	D. L. Serventy
Tambourine Lake, Ulladulla, N.S.W.	4.ix.1963	SSW (many specimens)	I. F. B. Common
8km E Braidwood, N.S.W.	21.x.1951	WSW 4-11/min/250m	I. F. B. Common
Broken Bay, Kariong, N.S.W.	iii.1963	N	M. Burnell
	19.i.1964	NNW	M. Burnell
Sydney (several localities)	22-28.xi.1966	S, W	C. N. Smithers and J. V. Peters
Hunter's Hill N.S.W.	2.x.1967	SSW	J. Hutchinson
Turramurra, N.S.W.	31.viii.1969	SW	C. N. Smithers
Turramurra, N.S.W.	7-9.ix.1969	SW	C. N. Smithers
Ryde, N.S.W.	8.ix.1969	SW	C. N. Smithers
Sydney	26.ix.1973	SW	C. N. Smithers and R. Brewer
48km N Singleton, N.S.W.	30.ix.1973	SW (few, with <i>V. kershawi</i>)	C. N. Smithers
Turramurra, N.S.W.	4.x.1973	SSW	C. N. Smithers
Richmond, N.S.W.	4.x.1973	SSW	C. N. Smithers
48km N Singleton, N.S.W.	21.iv.1981	NW	C. N. Smithers

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References

- Evans, B., 1977. *Hypolimnas misippus* (L.) and *Euploea core corinna* (W. S. Macleay) (Lepidoptera: Nymphalidae) from Norfolk Island. *Aust. ent. Mag.* 3(6): 106.

- Gall, I., 1966. Our butterflies over the ocean. *Courier Mail* 19 Nov. 1966.
- Fletcher, B. S., 1973. Observations on a movement of insects at Heron Island, Queensland. *J. Aust. ent. Soc.* 12: 157-160.
- Fox, K. J., 1978. The transoceanic migration of Lepidoptera to New Zealand—a history and a hypothesis on colonisation. *N.Z. Ent.* 6: 368-380.
- Gibbs, G. W., 1961. New Zealand butterflies. *Tuatara* 9: 65-76, 2 pls.
- Gibbs, G. W., 1969. A large migration of the Australian Painted Lady Butterfly *Vanessa kershawi* (McCoy) in New Zealand. *N.Z. Ent.* 4(2): 14-21.
- Hembrow, C. R., 1966. Report on butterfly migration 13th November 1966. *Qd Nat.* 18(5 & 6): 115.
- Hembrow, C. R., 1974. Butterfly migration. *Q.N.C. News* 62: 7.
- Holloway, B. A., 1954. Notes on Lepidoptera. *N.Z. Ent.* 1(4): 13-14.
- Holloway, B. A., 1962. *Melanitis leda* (Linn.) and other migrant butterflies in New Zealand during 1962. *Rec. Dominion Mus.* 4(8): 79-82.
- Hudson, G. V., 1898. *Moths and butterflies of New Zealand*. Wellington. i-xix, 144 pp.
- Hudson, G. V., 1928. *The butterflies and moths of New Zealand*. Wellington. i-xi, 386 pp.
- Hudson, G. V., 1939. *A supplement to the butterflies and moths of New Zealand*. Wellington. pp. 385-481, pls LIII-LXII.
- Hudson, G. V., 1950. *Fragments of New Zealand Entomology*. Wellington. 188 pp. 19pls.
- Moulds, M. S., 1963. Records of northern butterflies in the Sydney district. *Commun. R. zool. Soc. Ent. Sect.* 17: 36-38.
- Moulds, M. S., 1964. Records of northern butterflies in the Sydney district. *Commun. R. zool. Soc. Ent. Sect.* 23: 63-67.
- Moulds, M. S., 1976. Migration of *Narathura araxes eupolis* (Lepidoptera: Lycaenidae) across Lloyd Bay, Cape York Peninsula. *Aust. ent. Mag.* 2(6): 130-132, 1 fig.
- Ramsay, G. W. and Ordish, R. G., 1966. The Australian blue moon butterfly *Hypolimnas bolina nerina* (F.) in New Zealand. *N.Z. J. Sci.* 9(3): 719-729.
- Reeves, D. M., 1971. Notes on some butterflies from Erskine Island. *Qd Nat.* 20(1-3): 54-55.
- Rose, A. B., 1972. Additional records of butterflies from Kuring-gai Chase National Park, New South Wales. *Aust. ent. Mag.* 1(2): 5-6.
- Seitz, A., 1890. Allgemeine Biologie der Schmetterlinge. I Theil. *Zool. Jb. Abt. Syst.* 5: 281-343.
- Smithers, C. N., 1963. A migration of *Zizeeria labradus*. *Commun. R. zool. Soc. ent. Sect.* 17: 36.
- Smithers, C. N., 1969. A note on migration of *Vanessa kershawi* (McCoy) (Lepidoptera: Nymphalidae) in Australia. 1963-1968. *Aust. Zool.* 15: 188-194.
- Smithers, C. N., 1970. Migration records in Australia. 1. Homoptera, Coleoptera, Diptera and Hymenoptera. *Aust. Zool.* 15: 380-382.
- Smithers, C. N., 1974. A migration of *Vanessa kershawi* (McCoy) (Lepidoptera: Nymphalidae) in Western Australia. *West. Aust. Nat.* 13(1): 16.
- Smithers, C. N., 1978. Migration records in Australia. 2. Hesperidae and Papilionidae (Lepidoptera). *Aust. ent. Mag.* 5(1): 11-14.
- Smithers, C. N., 1983. Migration records in Australia. 3. Danainae and Acraeinae (Lepidoptera: Nymphalidae). *Aust. ent. Mag.* 10(2,3): 21-27.
- Smithers, C. N., 1983a. Migration records in Australia. 4. Pieridae other than *Anaphaeis java teutonia* (Fab.) (Lepidoptera). *Aust. ent. Mag.* 10(4): 47-54.
- Smithers, C. N. and Peters, J. V., 1966. A migration of *Vanessa kershawi* (McCoy) in Australia. *J. ent. Soc. Qd* 5: 67-69.
- Williams, C. B., 1930. *The migration of butterflies*. London. i-xii, 473 pp.
- Williams, C. B., 1939. Some butterfly migrations in Europe, Asia and Australia. *Proc. R. ent. Soc. Lond.* (A) 14: 131-137.
- Williams, K. A. W., 1968. Migration of Caper White butterfly in November, 1966. *Qd Nat.* 18(5 & 6): 113-115.